UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/797,298 | 03/09/2004 | Mark D. Elkovitch | 134380-2 | 4441 |

23413 7590 01/24/2008

CANTOR COLBURN, LLP
20 Church Street
22nd Floor
Hartford, CT 06103

| EXAMINER | |
|---|---|
| THOMAS, JAISON P | |
| **ART UNIT** | **PAPER NUMBER** |
| 1796 | |

| MAIL DATE | DELIVERY MODE |
|---|---|
| 01/24/2008 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

**BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**



Application Number: 10/797,298
Filing Date: March 09, 2004
Appellant(s): ELKOVITCH, MARK D.

David E. Rodrigues
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 11/14/2007 appealing from the Office action mailed 3/13/2007.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

a) International PCT Application Publication No. WO 97/15935 to Shibuta et al. dated 5/1/1997.

b) Applied Nanotech Inc. webpage (http://www.applied-nanotech.com/cntproperties.htm) dated 4/5/2003 as per the Internet Archive Wayback Machine webpage filed in the case on 3/13/2007.

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

a) Claims 1-17, 20-24 and 41 stand rejected under 35 USC § 102(b) as being anticipated by International PCT Application Publication No. WO 97/15935 to Shibuta et al., hereafter "Shibuta".

Shibuta teaches a transparent electrically conductive film containing an organic or inorganic matrix having carbon microfibers and an electrically conductive metal oxide powder dispersed therein (Abstract). Carbon fibrils that are used in the invention are described in US Patent 4663230, which are incorporated by reference (pg. 5., line 2-3). Patent '230 describes carbon fibrils being made from a dispersion containing a carbon containing compound and a metal particle catalyst (Patent '230, Abstract) wherein the catalyst contains iron, nickel or cobalt (Patent '230, Column 3, line 50) (which examiner construes as creating nanotubes with impurities meeting the limitations of Claims 9,10, and 15). Shibuta describes the organic matrix as being a variety of polymers disclosed on pg. 8, lines 16-29 and the binder can be used alone or with another unreactive resin (pg. 9, lines 28-30) (which examiner construes as inherently resulting in a blended resin having a phase separated morphology such that carbon nanotubes will migrate to the resin component in which it has a higher miscibility as required by Claim 17). Shibuta also describes the conductive metal oxide particles as including titanium oxide and zinc

oxide wherein particle sizes of the said metal oxide can be smaller then 0.1 micron (pg. 6, lines 37-38 thru pg. 7, lines 1-17) and are present in the composition from 1 to 30 weight percent (pg. 7, lines 27-29).

With respect to the physical characteristics of the carbon nanotubes as recited in Claims 1,3-8,11-14 and 20, the examiner respectfully submits that the prior art inherently meets the claimed limitation. Specifically, the reference teaches identical components and is produced in the same/similar manner and would inherently possess above limitations.

b) Claims 4-8 and 11-14 stand rejected under 35 USC § 103(a) as being unpatentable over Shibuta, in view of Applied Nanotech Inc. (hereafter "ANI") webpage (http://www.applied-nanotech.com/cntproperties.htm).

Shibuta is relied upon as disclosed above. However, Shibuta is silent with respect to the rope configurations, metallic versus semi-conducting nanotubes, or nanotube conformations (armchair versus zig-zag).

The ANI webpage teaches a summary of the common physical parameters of carbon nanotubes including tube diameters (1-50 nm) (pg. 1), carbon nanotube chirality and different configurations (armchair vs. zigzag) and their relationship to the conductive properties to the nanotube (metallic vs. semiconducting, respectively) as well as the suggestion that even in a group of nanotubes containing random chirality, up to 1/3 of the resulting tubes could have metallic (armchair) type configurations (pg. 3) which examiner construes as inherently possessing a ballistic type of electron transport.

The webpage also shows a picture illustrating a bundle of eight single-walled nanotubes (pg. 2) which examiner construes as constituting a rope structure.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to understand that the carbon nanotubes of. would posses the physical properties required by Claims 4-8 and 11-15 as the ANI webpage teaches the common physical properties of carbon nanotubes.

With respect to the rope limitations of Claims 5-8, it would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the number of carbon nanotubes of Shibuta. As to optimization results, a patent will not be granted based upon the optimization of result effective variables when the optimization is obtained through routine experimentation unless there is a showing of unexpected results which properly rebuts the prima facie case of obviousness. See *In re Boesch*, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980). See also *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936-37 (Fed. Cir. 1990), and *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

**(10) Response to Argument**

**a) Claims 1-17, 20-24 and 41 are patentable under 35 USC § 102(b) as being anticipated by Shibuta.**

Applicant's first argument states that the Abstract of the Shibuta reference teaches the use of electrically conductive particles (e.g. antimony doped tin oxide) which teaches away from the use of electrically non-conductive particles as presently claimed. Secondly, Applicant contends Shibuta incorrectly identifies zinc oxide and

titanium oxide as being electrically conductive. To support this argument, Applicant has cited another PCT Application Publication to the same author (WO 97/15934) which recites titanium oxide and zinc oxide as being nonconductive with the relevant sections quoted in the brief. Applicant suggests that Shibuta's mischaracterization of the oxides as being conductive is due to the fact that zinc and titanium oxides can be doped to be made electrically conductive which is also taught in WO 97/15934. Applicant concludes that zinc oxide and titanium oxide are not conductive and therefore Shibuta does not read on the limitations of Claim 1 requiring a nanosized dispersion agent which is electrically non-conducting.

The Examiner respectfully disagrees with Applicant's conclusions. The Examiner notes that the reference is relied upon for all that it discloses and that this is not limited to only the Abstract. The Examiner does concur with Applicant that zinc oxide and titanium oxide have been traditionally considered in the art as electrically non-conducting. However, the Examiner also notes in Shibuta on p. 6 lines 37-38 through p. 7, lines 1-9:

> "Examples of electrically conductive metal oxides which be used in the present invention include tin oxide, indium oxide, zinc oxide, titanium oxide, tungsten oxide, molybdenum oxide, vanadium oxide, and mixed oxides of these materials. The electrical conductivity of these conductive metal oxides can be increased by the addition of a different element to produce an oxygen deficiency, so another element can be added as necessary." (Emphasis added).

The Shibuta reference clearly envisions two embodiments of the invention by use of the phrases "can be" and "as necessary" i.e. a first embodiment containing unmodified oxides such as zinc oxide and titanium oxide and a second embodiment that

uses oxides which can be further doped with additional compounds to increase the oxide's level of conductivity. Whereas the second embodiment of Shibuta would not read on Applicant's instant claims, clearly the first embodiment of the invention is identical in scope to the limitations of the instant claims i.e. containing an unmodified zinc oxide or titanium oxide which is electrically non-conducting as Applicant had concluded in their own Arguments. Shibuta's mischaracterization of the oxides as being conductive is immaterial to the fact that there is a chemical identity between the components of the Shibuta composition and the components used in Applicant's instantly claimed composition. Shibuta, thus, does anticipate the instant claims, and the instant claims are unpatentable over Shibuta.

**b) Claims 4-8 and 11-14 are patentable under 35 USC § 103(a) over Shibuta in view of ANI.**

Applicant assert that in view of the Remarks in the brief with respect to the § 102(b) rejection over Shibuta, the combination of Shibuta and ANI fails to teach or suggest all the elements of Claims 4-8 and 11-14.

The Examiner respectfully disagrees and references comments listed above.

**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Jaison Thomas
Examiner
AU 1796

RANDY GULAKOWSKI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700

Conferees:

Romulo H. Delmendo
Appeal Conferee